

IN THE SPECIFICATION

Please amend paragraphs 5, 18, 19, 20, 63 and 70 (as numbered in U.S. Patent Application Publication 2003/0156665 A1) as follows:

[0005] Techniques are provided for fine-tuning estimates of a delay value and other parameters of interest associated with a sampled signal. One aspect of the invention is to use, for the sampled signal, calculations of the In Phase and Quadrature (I and Q) correlation integrals at a limited number of coarsely spaced points, wherein the calculations are performed for a set Σ_1 of hypothesized delay values. These coarse-grained IQ correlations can be carried out by means of dedicated hardware, or the method described in U.S. patent application Ser. No. 09/888,227, filed on the same day herewith, entitled "Synthesizing Coherent Correlation Sums at One or Multiple Carrier Frequencies Using Correlation Sums Calculated at a Coarse Set of Frequencies", by inventors Anant Sahai and John Tsitsiklis, (Attorney Docket No. 60021-0012), or any other possible way. A subset of I and Q correlation values based on the coarse granularity calculations of the I and Q correlation functions is used to perform an interpolation to obtain fine-grained values of the I and Q integrals in the range of the delay, or other parameter, values of interest. Searching over such interpolated values effectively produces correspondingly fine precision estimates of the delay, or other parameter, values in the range of interest.

[0018] FIG. 2 is a flowchart that illustrates the simplest embodiment of a technique for fine-tuning estimates of delay values associated with a received signal that is received in accordance with block 210 of FIG. 2. FIG. 3 illustrates the technique based on template-matching. In certain embodiments of the invention, server D performs the steps as described herein with reference to FIG. 2 and FIG. 3.

[0019] Coarse IQ Correlation: At block 220, coarse-grained calculations of IQ correlation integrals are performed for the sampled data at a set Σ_1 of hypothesized delay values. The determination of a range of hypothesized delay values can be based on the uncertainty in certain basic variables like space and time, or might be known from other sources depending on the application at hand. Determining this range is further described in U.S. patent application Ser. No. 09/888,229, filed on the same day

herewith, entitled "Determining the Spatio-Temporal and Kinematic Parameters of a Signal Receiver and Its Clock by Information Fusion", by inventors Anant Sahai, Andrew Chou, Wallace Mann and Stefano Casadei, (Attorney Docket No. 60021-0014), now U.S. Patent 6,542,116. In one embodiment of the invention, described further in U.S. patent application Ser. No. 09/888,228, filed on the same day herewith, entitled "Signal Acquisition Using Data Bit Information", by inventors Anant Sahai, Wallace Mann, Andrew Chou and Benjamin Van Roy (Attorney Docket No. 60021-0011), now U.S. Patent 6,512,479, the coarse-grained calculations are carried out together by dividing the sampled signal into a plurality of blocks of data. Alternatively, the coarse-grained calculations can be carried out individually in the direct manner well known to those skilled in the art.

[0020] The coarse-grained IQ correlations can also be carried out by means of dedicated hardware, or the approximate method described in U.S. patent application Ser. No. 09/888,227, filed on the same day herewith, entitled "Synthesizing Coherent Correlation Sums at One or Multiple Carrier Frequencies Using Correlation Sums Calculated at a Coarse Set of Frequencies", by inventors Anant Sahai and John Tsitsiklis, (Attorney Docket No. 60021-0012), or by any other known technique.

[0063] Among the causes that affect the shape and bandwidth of the filter $H_{sub.w, \alpha}$, are the duration of the correlation integrals, the properties of the A/D converter (and filters therein), and the nature of the approximations during the calculations of the correlation integrals (As those in U.S. patent application Ser. No. 09/888,228, filed on the same day herewith, entitled "Signal Acquisition Using Data Bit Information", by inventors Anant Sahai, Wallace Mann, Andrew Chou and Benjamin Van Roy, (Attorney Docket No. 60021-0011)), now U.S. Patent 6,512,479, and U.S. patent application Ser. No. 09/888,227, filed on the same day herewith, entitled "Synthesizing Coherent Correlation Sums at One or Multiple Carrier Frequencies Using Correlation Sums Calculated at a Coarse Set of Frequencies", by inventors Anant Sahai and John Tsitsiklis, (Attorney Docket No. 60021-0012)).

[0070] An embodiment of the invention may be implemented using a computer system that includes a processor for processing information. One example of such an implementation is described in the following and illustrated in FIG. 4. The Computer

system also includes a main memory, such as a random access memory (RAM) or other dynamic storage device, coupled to a bus for storing information and instructions to be executed by the processor. The main memory also may be used for storing temporary variables or other intermediate information during execution of instructions to be executed by the processor. The computer system further includes a read only memory (ROM) or other static storage device coupled to the bus for storing static information and instructions for the processor. A storage device, such as a magnetic disk or optical disk, is provided and coupled to the bus for storing information and instructions.